

**Washington Occupational Injury and Illness Surveillance and Prevention Program**  
**Principal Investigator: David Bonauto, MD, MPH**

**Washington State Department of Labor and Industries**  
**Safety and Health Assessment and Research for Prevention (SHARP) Program**

**Annual Report of Accomplishments and Outcomes, July 1, 2012-June 30, 2013**

**Washington Fundamental Occupational Safety and Health Surveillance Program**

Program Director: David Bonauto, MD, MPH, bone235@lni.wa.gov, (360) 902-5664

Project Epidemiologist: Naomi Anderson, MPH, anna235@lni.wa.gov, (360) 902-4957

The goal of Washington State's fundamental occupational safety and health surveillance program is to enhance capacity to provide information for action to improve the occupational safety and health of Washington's 3.3 million workers working at any of the 160,000 employers within the state.

1. The Occupational Health Indicator data describes the occupational health status of the Washington State working population. Washington collaborates with other NIOSH funded states to publish the indicator data on the CSTE website. Publication of the collaborative datasets often lags the availability of the data for individual indicator completion.

**Output:** Washington State has accelerated the publication of the twenty CSTE Occupational Health Indicators on the Washington State Department of Labor Website. We publish quarterly to semiannual web-based updates of the most current indicator data available for Washington State. The data updates are available at <http://www.lni.wa.gov/Safety/Research/Pubs/#Surveillance>.

2. The NIOSH-funded Washington State occupational health surveillance program has core expertise in using varied state-level data resources (e.g. workers compensation data, hospital discharge data) to respond to emerging hazards and data requests from employers, workers, and groups representing employer and employees.

**Intermediate Outcome:** The WA Occupational Health Surveillance Program submitted detailed industry, occupation, process, and task data for 27 cases of isocyanate-induced asthma to OSHA to inform the development of OSHA's National Emphasis Program (NEP) on isocyanates.

**Output:** Data from Washington State's work-related asthma surveillance system were used to characterize isocyanate-induced asthma cases occurring from 1999 through 2010. A paper was submitted for peer-review publication to JOEH in November/December 2012.

- Key observations are made regarding the development of work-related asthma in association with a) paint application on large objects difficult to ventilate, b) indirect exposure to isocyanates, c) exposure during secondary or clean-up processes, and d) reports of dermal exposure. If used these observations may lessen the risk of isocyanate asthma.

**Output:** A breakout session presentation was made at the Council of State and Territorial Epidemiologists (CSTE) June 2013 Annual Conference that discussed the results of the isocyanates-induced asthma cases in WA from 1999 through 2010.

3. Surveillance data that systematically evaluates occupational injury and illness by industry are relatively scarce, as are resources for prevention. Washington State periodically produces a report prioritizing industries for prevention efforts based on high rate and high count of workers' compensation claims using a Prevention Index (PI) to identify where injuries are occurring, and where the most benefit from research and prevention could be gained.

**Output:** A Technical Report was published in April 2013 which examines which industry groups are at high risk for seven common injury types in Washington State to establish a basis for efficient targeting of prevention resources. Between 2002-2010, there were 267,581 compensable Washington SF claims. These accounted for over 11 billion dollars in direct workers' compensation costs.

- The top 5 industry groups for 'All Injury Types' were: Foundation, Structure, and Building Exterior Contractors (NAICS 2381); Residential Building Construction (NAICS 2361); Building Finishing Contractors (NAICS 2383); General Freight Trucking (NAICS 4841); and Building Equipment Contractors (NAICS 2382). These 4 Construction industry groups are ranked highly for prevention in the PIs for almost all of the 7 identified injury types. Logging (NAICS 1133), Other Specialty Trade Contractors (NAICS 2389), and Services to Buildings and Dwellings (NAICS 5617) also appear in the Top 25 of all 7 identified common injury types.

**Output:** A breakout session presentation was made at the Council of State and Territorial Epidemiologists (CSTE) June 2013 Annual Conference that discussed the methodology of the PI framework, our most recent published results, and preliminary results of expanding the PI framework to include some measure of severity.

**Intermediate Outcome:** The Prevention Index (PI) framework has been adopted by WA's Division of Occupational Health and Safety (DOSH) which has begun to use the PI framework and produce material in accordance with this methodology for education and outreach activities.

4. Very little data are available to describe health and health behaviors of the workforce at the state level by the workers' industry and occupation of employment. Washington State has collected Industry and Occupation (I/O) data from 1997 through 2011 on the Washington State Behavioral Risk Factor Surveillance System (BRFSS). We have coded I/O for nearly 80,000 Washington State BRFSS respondents for the years 2003 – 2010.

**Output:** We produced a paper further describing and analyzing the distribution of self-reported ILI in Washington, and identifying occupations with increased risk of ILI, published by PLOS ONE in November 2012 (with 1,346 views and 6 social shares as of June 2013).

- 'Janitors and Cleaners' (PR 2.5; 95% CI 1.3, 4.7) and 'Secretaries' (PR 2.4; 95% CI 1.1, 5.4) had an increased risk of ILI as compared to the overall prevalence and a reference group; while 'Truck Drivers' (PR 0.2; 95% CI 0.1, 0.7) and

‘Technicians, not elsewhere classified’ (PR 0.4; 95% CI 0.2, 0.9) had lower risk of ILI than other occupations that were analyzed.

**Output:** Obesity is a threat to public health. The prevalence of obesity has increased in the United States in recent decades, and is associated with sick leave, absenteeism, increased risk of cancers, musculoskeletal disorders, cardiovascular disease, and stress. Estimating the prevalence of obesity across occupational categories can help identify at-risk populations, and aid in the development of targeted prevention efforts. Using BRFSS data (odd numbered years 2003-2009), we estimated the prevalence of workers across occupational categories in WA. A paper on these data was submitted for peer-review publication in June 2013.

- The overall prevalence of obesity for all workers was 24.6% (95% CI 24.0 – 25.1), ranging from 11.6% (95% CI 8.0 – 15.2) for Health Diagnosing Occupations to 38.6% (95% CI 33.3 – 44.0) for Truck Drivers. There was significant disparity in obesity prevalence (as well as intake of fruits and vegetables, and levels of Leisure Time Physical Activity) across occupations in WA. Several occupations with significantly higher prevalence estimates of obesity compared to the reference group (Health Diagnosing Occupations) included Truck Drivers, Transportation and Material Moving, Protective Services, and Cleaning/Building Services.

**Output:** A breakout session presentation was made at the Council of State and Territorial Epidemiologists (CSTE) June 2013 Annual Conference that discussed a variety of Washington State Occupational Injury and Illness Surveillance and Prevention Program’s published analyses of BRFSS Industry & Occupation data, particularly results demonstrating the differences by occupation in: underreporting of work-related injury; depression & frequent mental distress; obesity; and influenza-like illness.

#### **Major Outputs:**

Anderson NJ, Bonauto DK, Fan ZJ, Spector J. Distribution of Influenza-like Illness (ILI) by Occupation in Washington State, September 2009-August 2010. PLOS ONE. 2012;7(11):e48806.

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0048806>

Anderson N, Bonauto D, Adams D. Prioritizing Industries for Occupational Injury and Illness Prevention and Research, Washington State Workers' Compensation Claims Data, 2002-2010. Washington State Department of Labor & Industries; Olympia, WA. April 2013. Technical Report #64-1-2013. [http://www.lni.wa.gov/Safety/Research/Files/bd\\_3F.pdf](http://www.lni.wa.gov/Safety/Research/Files/bd_3F.pdf)

Bonauto D, Lu D, Fan ZJ. *Preventing Chronic Disease*. In process, submitted June 19, 2013. Reeb-Whitaker C, Anderson NJ, Bonauto DK. Prevention Guidance for Isocyanate-induced Asthma using Occupational Surveillance Data. *Journal of Occupational & Environmental Hygiene*. In production, submitted November/December 2012.

## Washington Fatality Assessment and Control Evaluation (WA FACE) Program

Program Director: Todd Schoonover, PhD, [scto235@Lni.wa.gov](mailto:scto235@Lni.wa.gov), (360) 902-5663

The goal of the Washington State FACE program is to prevent workplace fatalities through surveillance, fatality investigations, and prevention activities.

### **1. Improving Safety through targeted distribution of new WA FACE Materials**

**A. Output: Prevention resources on the web:** From July 2012 – June 2013, WA FACE created new prevention resources for employers, health and safety professionals, and workers (see [www.Lni.wa.gov/Safety/Research/FACE/default.asp](http://www.Lni.wa.gov/Safety/Research/FACE/default.asp)):

- 10 Fatality Narratives (Construction (n=8), Agriculture (n=2)).
- 4 FACE Fatality Investigation Reports.
- 2 Hazard Alerts (1 in English and Spanish).

Each new prevention resource contains incident-specific prevention recommendations. Combined, these resources were directly distributed via 9100 email messages. FACE maintains growing distribution lists for these publications. There were 233,306 webserver requests for FACE prevention resources, an increase of 13% from the previous year.

### **B. Intermediate Outcome: Prevention resources targeting specific industries by trade journal:**

**WA FACE** collaborated with industry trade associations to publish and distribute investigation findings and recommendations. These are effective methods to influence hazard awareness, safety training and practices, and safe product design. WA FACE successfully submitted findings and recommendations to the following trade journals:

- American Machinist Magazine: Washington State's Fatality Assessment and Control Evaluation (FACE) Program issues recommendations for protecting lathe operators, published December 13, 2012.
- Good Fruit Grower: Orchard safety spotlight, published April 2013.

### **C. Potential Outcome: Prevention resources targeting specific employers:**

WA FACE utilized the WA State workers' compensation database to effectively communicate prevention messages to employers at risk of specific hazards.

#### WA FACE Fatality Narratives:

- 131 copies of "Deck Engineer on Barge Dies When Struck by Crane Counterweight in Washington State" mailed to WA risk class-mobile crane and hoisting services employers.
- 267 copies of "Carpet Installer Dies after Falling 32 Feet at a Commercial Jobsite" mailed to small employers in WA risk class-floor covering installers.
- 215 copies of "Skid Steer Loader Operator Impaled by Rebar" mailed to employers in WA risk class-building demolition contractors.
- 394 copies of "Roofer Dies after Falling from Ladder or Roof" mailed to employers in WA risk class-residential roofing contractors.
- 420 copies of narrative "Operator Dies after Being Caught between Bulldozer's Track and Fender" mailed to employers in WA risk class-excavating and land clearing.
- 336 copies of "Laborer Falls through Roof Opening" mailed to employers in WA risk class-roof construction and repair.

#### WA FACE Investigation Reports:

- 824 copies of "Machinist Dies after Being Struck by Rotating Steel Bar Stock in Lathe in

Washington State" mailed to employers in WA risk classes-machine shops, machine manufacturing, machine operation and regional technical colleges.

- 420 copies of investigation report "Operator Dies after Being Caught between Bulldozer's Track and Fender" mailed to employers in WA risk class-excavating and land clearing.
- 450 copies of investigation report "Orchard Laborer Dies when Crushed Between a Motor Grader and Semi-Truck in Washington State" mailed to employers in WA risk class-orchards.
- 193 copies of "Truck Driver Dies after being Run Over by Propane Transport Rolling Backward at Bulk Plant" mailed to WA risk class-gas and oil dealers, natural gas companies.

**WA FACE Hazard Alerts:**

- 318 copies of "Successful Bathtub Stripping with Benzyl Alcohol as an Alternative to Methylene Chloride" mailed to employers engaged in bathroom, tub, tile, porcelain, remodeling and refinishing.
- 563 copies in English and Spanish versions of "Hazards to Orchard Tractor and Machinery Operators" mailed to employers in WA risk classes-orchards, fresh fruit and vegetable packing.

**D. Outputs: Prevention resources presented and distributed at conferences and meetings:** WA FACE prevention resources were distributed at several conferences and meetings where the potential for impact was high due to the large audiences of health and safety professionals, labor representatives, and young workers.

- Puget Sound Safety Summit: 10 meetings attended with approximately 3,100 FACE documents distributed.
- Seattle Vicinity Construction Safety Council: 1 meeting attended with approximately 90 FACE documents distributed.
- Build-it-Smart: 1 meeting attended with approximately 90 FACE documents distributed.
- Mount Rainier Safety Meeting: 1 meeting attended with approximately 100 FACE documents distributed.
- Washington State Contract Loggers Association Safety Day: FACE documents distributed to 417 attendees.
- Young injured worker speaker series: FACE documents distributed to over 1500 students at 5 regional high schools and 4 apprentice training programs.
- Washington State Apprenticeship Program Managers Meeting: over 200 FACE documents distributed to apprentice program managers.
- Try-A-Trade-Day: FACE documents distributed to 654 student and apprentice attendees.

**2. Improving Safety through targeted use of WA FACE Materials**

**A. Intermediate Outcome: Planned safety improvements by employers resulting from WA FACE Investigation Report recommendations:** WA FACE sent investigation evaluations in the form of self-addressed stamped returnable postcards to employers who do not receive FACE reports electronically to assess the quality, intended uses, and impact of prevention recommendations on workplace safety.

Machinist (lathe) Operator Investigation Report-116 Responses:

- 84% rated usefulness as good, very good, or excellent.

- 91% rated readability as good, very good, or excellent.
- 53% will distribute to employees/others.
- 58% will use to identify hazards.
- 55% will use for trainings/toolbox talks.

Bulldozer Operator (construction) Investigation Report-68 Responses:

- 93% rated usefulness as good, very good, or excellent.
- 97% rated readability as good, very good, or excellent.
- 47% will distribute to employees/others.
- 54% will use to identify hazards.
- 88% will use for trainings/toolbox talks.

Motor Grader Operator (agriculture) Investigation Report-67 Responses:

- 66% rated usefulness as good, very good, or excellent.
- 84% rated readability as good, very good, or excellent.
- 20% will distribute to employees/others.
- 54% will use to identify hazards.
- 63% will use for trainings/toolbox talks.

Propane Transport Driver Investigation Report-29 Responses:

- 86% rated usefulness as good, very good, or excellent.
- 93% rated readability as good, very good, or excellent.
- 59% will distribute to employees/others.
- 69% will use to identify hazards.
- 62% will use for trainings/toolbox talks.

**B. Intermediate Outcome: Documented safety training, hazard assessment and abatement, and worker protection resulting from WA FACE recommendations (end outcomes):** WA FACE prevention resources are disseminated by email predominantly to health and safety professionals. The WA FACE web-based electronic survey provides valuable feedback from these users and documents the quality, uses, and impact of WA FACE prevention resources on workplace safety. Of 57 total respondents, 92% considered WA FACE products “Good to Excellent” resources in terms of usefulness and readability.

Overall opinion of WA FACE document?

Opinion	Poor	Fair	Good	Very good	Excellent
Usefulness of materials	0%	9%	18%	43%	30%
Readability of materials	2%	4%	10%	51%	33%

How have you used this document?

Changes after reading this document?

Use	Percent	Changes	Percent
Personal awareness	67%	Identifying hazards	69%
Trainings or tool box talks	59%	Planning a job	29%
Distribute to employees/others	48%	Use of safety gear	25%
Post on bulletin board	36%	Setting up a job or work site	22%
Use of safety gear	18%	Procedures for completing a job	29%
Reporting hazards	11%	Choice or use of tools/equipment	31%

## Using Workers' Compensation Data to Identify High Risk Workplaces for Work-related Musculoskeletal Disorders (WMSDs)

Program Director: Barbara Silverstein, PhD, silb235@lni.wa.gov, (360) 902-5668

Project Coordinator: Daniel Hunter, MA, [hund235@lni.wa.gov](mailto:hund235@lni.wa.gov), (360) 902-6836

The overall goal of this project is to develop and test a surveillance system to identify prevention efforts for high hazard workplaces by industry sector and size for work-related musculoskeletal disorders (WMSDs) like carpal tunnel syndrome or tendonitis in four body regions shoulder, hand/wrist, back, or knee. We are comparing different exposure assessment methods (Quick Exposure Checklist, Washington State Caution and Hazard Checklists, ACGIH TLVs for Hand Arm Activity Level (HAL) and Low back). To this end, our team has in the past year:

- Reassessed the magnitude and distribution of WMSD workers compensation (WC) claims frequency, incidence, and cost by industry and NAICS size using the most current available data;
- Conducted seventy-four (74) injured worker telephone interviews within ninety days of identifying compensable WMSD claims with four or more lost workdays;
- Conducted fifty-two (52) management and union/safety committee interviews among high and low incidence rate companies by industry group within each of seven NORA sectors regarding injury experience, WMSD risk factors, training, employment patterns, safety culture, and turnover to identify potential explanations for differences in WC claims rates; and,
- Conducted fifteen (15) paired employer site visits to high and low WMSD incident rate companies to identify potential differences in exposures, management culture, and safety issue awareness via site walkthroughs, worker observations, and job-based WMSD risk factor assessment.

### **Major Outputs**

#### **Company Site Visits for WMSD Risk Factor Assessment**

- We identified Washington businesses from seven NORA sectors with both upper and/or lower quartile incidence rates for WMSDs in one or more body regions (back, shoulder, hand/wrist, and knee).
- In the past year, we have completed 20 site visits to 15 different participating companies to conduct worker observations and job hazard assessments.
- We have visited fifteen (15) companies including manufacturers in the metal and wood products industries, construction contractors (including roofing, plumbing, and HVAC), nurseries and landscaping services, fruit growers and packers, and community and nursing care facilities for the elderly.
- During these visits SHARP staff members have had the opportunity to consult with company representatives regarding safety issues of specific interest to employers, and have discussed suggestions for reducing exposures to WMSD risks.
- Additionally, our field teams have helped participating companies recognize and highlight individual workers' innovative solutions to potential hazards, encouraging safety representatives to disseminate these ideas as best practices throughout their broader worker population.

## Job Evaluation Reports

- In the past year, we have generated and delivered fifteen (15) job evaluation reports containing detailed analysis regarding potentially hazardous risk factors and targeted recommendations for injury prevention as well as overall exposure assessments including instances where jobs may currently meet or exceed industry best practices.
- Reports are generated directly from data gathered using the handheld digital checklist and serve to supplement companies' existing safety programs with objective findings from professional occupational health experts; a color coded quick reference page helps employers quickly identify jobs with potentially hazardous risk factors, and this year we have generated and delivered thirty reports to participating companies.

## Presentations and papers

- To date, Dr. Silverstein has presented the methods and early partial results to:
  - University of Washington Department of Environmental and Occupational Health Sciences faculty and students (April 2012 and May 2013)
  - She also presented 3 papers at the 2013 triennial PREMUS conference in Busan Korea, July 2013
- Hunter D, Silverstein B. Perceptions of Risk from Workers in High Risk Industries with Work Related Musculoskeletal Disorders. *Work: A Journal of Prevention, Assessment and Rehabilitation*. Accepted: July 14, 2013.

## Exposure Assessment Tool: Digital Risk Factor Assessment Checklist App

- Risk factor data from company site visits are collected using a novel electronic checklist application developed for this purpose by SHARP staff and deployed using a small hand-held touch screen tablet. The checklist app affords the unique ability to observe, enter, calculate and analyze data seamlessly in the field, and allows ergonomists to identify and report potentially hazardous risk factors in real time.
- With the rise in handheld digital computing, we anticipate that this electronic WMSD hazard checklist will find traction throughout industry with a broad user base among regional and national occupational health professionals interested in identifying and mitigating high-risk job tasks.
- Pending final analysis of the job data as compared to WC compensation claims data, we will assess the predictive power of each tool for each of seven industry sectors and tailor industry-specific job evaluation tools into the software the will incorporate major evaluative components of several validated methods including the Washington State Department of Labor and Industries' Caution Zone Checklist, the Washington State Hazard Zone Checklist, the Strain Index method, as well as the Quick Exposure Check (QEC) method.
- The abundance of exposure parameters as well as the results derived using different job evaluation tools has provided a foundation for us upon which to compare exposures between companies with good injury records and those with poor injury records. During worksite visits, we collected detailed information about jobs and their task activities making it possible for us to (1) link specific task activities to potentially unsafe work conditions, (2) provide specific explanations for their causes, and (3) develop industry/job specific control measures.

## Injured Worker Stories from Interviews

- During our conversations with injured workers, we have gathered substantial evidence of the personal toll of WMSDs on the lives of both the injured worker and their families.
- We have also assessed the nature of risk at many of the jobs in high hazard industries as well as workers' detailed descriptions of how their injuries occurred and how they might have best been prevented.
- Navigating a workers' compensation system can be overwhelming, and we believe this body of personal testimony will serve as an impetus for action—for employers, health professionals, and insurance providers—to ensure injured workers' successful return to the workforce. Selected passages from a few recent interviews include the following:
  - *Personally, it affected everything in my life. It almost cost me my marriage. Financially, we've lost almost everything we had. We're contemplating filing bankruptcy. We've lost our TVs. We lost our washer and dryer. We've almost lost our cars. Our kids--we've had to move out to a little \*\*\*\*hole house in a different town because we couldn't afford the rent. I mean, it's affected everything in our life. Can't afford insurance for my cars, I can't afford nothing. I had to go get on welfare to get food for my kids. It's affected every part of my life.*
  - *I've seen how easily you can lose a lot of stuff by an injury. I've lost so much, a decent wage. I lost, probably an industry. I really can't go back to driving. I can't see myself driving anymore. Not because of...well, it is because of the injury, but not because it hurts or something along those lines. But I just, I have this fear, almost a nightmare, of being on the side of the road in the middle of nowhere, I mean literally nowhere, and hurting my back and not being able to get into the truck.*

## NORA Surveillance Projects (TIRES): Trucking Injury Reduction Emphasis through Surveillance (TIRES) Program

Program Director: Caroline Smith, MPH, smcb235@Lni.wa.gov, (360) 902-4528

Co-program Director: Dr. Barbara Silverstein, silb235@Lni.wa.gov, (360) 902-5668

The Washington State trucking industry has some of the highest costs and rates for work-related injuries, however very little is being done to address injuries other than those caused by motor vehicle collisions. Previous research by Washington State Department of Labor and Industries, SHARP Program revealed that the most common and costly injuries in trucking are musculoskeletal disorders, falls, motor vehicle collisions and injuries from being struck by or against an object. SHARP determined from the case follow-up surveillance data of the first TIRES grant that these injuries occurred during four particular work activities: loading and unloading activities including manual handling, securing the load, entering and exiting the cab, and walking around the job site. Determining and targeting the root cause of injuries is the continuing mission of TIRES and has been the driving force of reaching industry employers and workers through KeepTruckingSafe.org.

### **Outputs**

Outputs are developed through a collaborative process using information obtained from surveys completed by workers and employers, data extracted from injured worker claims and interviews and the direct guidance of the TIRES steering committee which consists of industry stakeholders such as employers, industry associations, labor groups and trainers, and insurers. All materials are developed to support industry best practices and to enhance the safety training of large and small employers.

For the period from July 1, 2012 to June 30, 2013, these outputs included:

- **Online simulation training tools** - Interactive, educational resource to be used by drivers and training personnel 1. [Lever vs. ratchet](#): compares the forces involved in using a ratchet versus a lever load binder. 2. [Tire chaining](#): gives workers the opportunity test their tire chaining safety skills. 3. [Load shift fatality](#): tells the true story of a driver who was killed. Produced 3.
- **TIRES E-news electronic newsletter** - Introduces and educates managers and safety personnel on the magnitude of specific injury types. [11 produced](#).
- **True story narratives** – Actual stories of Washington workers injured on the job. Includes injury prevention tips. [6 produced](#).
- **Tip sheets** – Injury prevention tips for specific scenarios. [6 produced](#), includes 1 translation into Spanish as requested by our stakeholders.
- **Posters** – Eye catching and educational posters for employee awareness. [12 produced](#).
- **Company corner** – Guest author from a local company shares his views on safety. [1 produced](#).
- **Peer review** – Smith, C., Williams, J. Work related injuries in Washington State's Trucking Industry, by industry sector and occupation. Submitted to Accident Analysis & Prevention.
- **Trade journal article** – Williams, J. [TIRES: Helping to reduce work-related injuries in the commercial trucking industries](#). Published in Northwest Transporter, Winter, 2013.

- **Website** - We continue to build on an interactive website where industry stakeholders can download free educational materials or share their own success stories. [www.KeepTruckingSafe.org](http://www.KeepTruckingSafe.org).
- **Social media** - We have expanded marketing and outreach into social media tools such as [Twitter](#), [YouTube](#) and the [TIRES Blog](#).
- **Outreach** – KeepTruckingSafe.org participates in industry events such as the World’s Largest Truck Convoy to benefit the Special Olympics, the Washington Truck Driving Associations’ Truck Driving Championships the American Historical Truck Society’s national convention and the port of Seattle’s voluntary truck inspections.
- **Presentations** – Presented TIRES simulations at the Annual Council for State and Territorial Epidemiologists (CSTE) in Pasadena, CA. June 2013.
- **Company trainings** – TIRES staff presented KeepTruckingSafe.org to a local company’s annual meeting of safety staff.

### **Outcomes (Potential)**

All TIRES publication are distributed through voluntary avenues, meaning people need to sign up to receive our materials or download them from our web pages, therefore, visits to our web sites are an accurate representation of the usefulness of the materials. During the past year, there were over **86,800 visits** to our web pages at <http://www.lni.wa.gov/Safety/Research/Trucking/Pubs/Default.asp> and [www.KeepTruckingSafe.org](http://www.KeepTruckingSafe.org).

The online simulation tools were developed in response to stakeholder requests for interactive trainings to meet the challenge of training younger drivers who believe they are invincible (e.g. Don’t Jump) and experienced drivers (e.g. Ratchet vs. Lever Binders) who don’t want to change from the way things have always been done. We know the simulations have been downloaded nearly **30,000 times**. We don’t know how many companies have downloaded to their company web sites or trainings, since the option is there and free to the public. We’ve been told by company safety personnel that they are using them in their new hire trainings. Our simulations are also available on external websites (e.g., SafetyDrivenCA) where they can be downloaded. We do not have a count of those downloads.

Leveraging social media - Our Twitter account was launched on October 20, 2011. We currently have **563 followers**. On a typical week, our exposure is **8,000 accounts** due to other users retweeting (forwarding) our information. A YouTube training video was viewed over 1,000 times. At least one blog article is posted per week and a special is released to honor each truck driver killed in Washington. The [TIRES blog](#) was visited **1,612 times** over the past year.

### **Outcomes (Intermediate)**

TIRES educational materials are being used by occupational safety and health professionals within the industry.

- TIRES training materials are used as a major component of Washington Teamsters Training, train-the-trainer program for the trucking and construction industries.

- TIRES has been contacted by other states' (AL, MT, MN and even Canada) workers' compensation programs to partner with TIRES to develop additional training materials and to use the materials already developed. Trucking injuries are similar across the globe so by sharing data and strategies, we've collaborated to make our materials even better.
- TIRES is responding to stakeholder feedback by continuing to produce safety materials and online training simulations. One of the largest truck driver staffing agencies in the nation, contacted us regarding our jump force simulation. They want a copy of it to run in the lobby of each of the 42 offices where potential truck drivers go for interviews.

## NORA Surveillance Projects (TEMPS): Temporary Worker Surveillance Program

Program Director: Michael Foley, f0lm235@lni.wa.gov, (360) 902-5429

### **Outputs:**

- Presentation at CSTE 2013 Conference (June 11, 2013): "The role of workers' compensation data in occupational health and safety surveillance of temporary workers."
- Peer-review publication: "Contingent Workers: Workers' Compensation Data Analysis Limitations and Strategies", submitted to American Journal of Industrial Medicine, December 2012 (in review).
- Access databases created: claimant case-control matching; call tracking/interview completion; claimant interview responses.

**Aim #1:** Characterize the magnitude of workers' compensation claims incidence among workers employed by temporary agencies grouped by industry sector, as represented by risk class, and compare to that of workers employed under standard employment arrangements working in comparable industries and occupations.

### **Potential Outcomes:**

- Time-loss claims rates in 2012 continue to show that for twelve temporary risk classes and their selected comparable permanent risk classes there was a significant excess rate of injury for temporary workers. The greatest discrepancy in injury rates between temporary workers and their permanent counterparts are in the following industry sectors: machine operation, vehicle operation, construction, agricultural services, food services and assembly operations.
- Other differences between temporary workers and their matched permanent counterparts which may be related to increased probability of injury include:
  - Median age at injury for temporary workers is 4 years younger than for permanent workers.
  - Gender distribution for temp workers is 75% male versus 62% male for permanent workers.
  - Median number of days on the jobsite for temp workers is about 13% that of permanent workers.
- Severity of injury may be greater for temporary workers: the median number of time loss days for temps is 68% greater than it is for matched permanent workers. This may also reflect greater difficulty in managing the return to work process for injured workers without a regular relationship to a particular workplace.
- The distribution of injuries by injury type (e.g. struck by; falls; caught in, etc.) is very similar to that of matched permanent workers.

**Aim #2:** Conduct 80 follow-up interviews per year with temporary workers and a matched set of standard workers to gain information about tasks, hazards, safety training, and ability to identify and report hazards. To date we have completed the following:

	Temporary Workers	Permanent Workers	Total
# claimants selected for interview	553	488	1,041
# calls made	950	850	1,800
# interviews complete	168	152	320
# completed interviews linked with a matched interview	71	123	194

### **Potential Outcomes:**

Preliminary results from interviews with injured temporary workers and their matched counterparts in standard, permanent employment showed that:

- Exposures to injury hazards were perceived by claimants to be distributed similarly between temporary and permanent workers, with the total level of hazard exposure slightly higher for permanent workers than for temporary workers. Greatest exposures for both categories of worker were to manual handling, machinery and falls
- Temporary workers were much less likely to be asked about their prior skills or experience before starting a job assignment than were permanent workers.
- Temporary workers received training that was less frequent and perceived to be less adequate than that of their permanently-employed peers. A higher percentage of temporary workers report receiving no safety training from their jobsite employer.
- Temporary workers report receiving greater supervision at the job site than do their permanent counterparts.

## Maintaining and Improving Pesticide-Illness Surveillance in Washington State

Performance Location: Washington State Department of Health (DOH)

Program Director: Joanne B. Prado, MPH, [joanne.prado@doh.wa.gov](mailto:joanne.prado@doh.wa.gov), (360) 236-3172

### **Major Outputs:**

- Completed 200 pesticide-illness investigations and annual upload of case data to NIOSH Sentinel Event Notification System for Occupation Risk (SENSOR).
- Planned illness prevention actions with partners and provided health information to farm workers, pest control operators, county and city employees, and representatives of government-owned housing.
- Developed reports and articles, two of which were published in a peer-reviewed journal.

### **Potential Outcomes:**

DOH reported 331 confirmed cases of pesticide-related illness due to agricultural pesticide drift from January 2002 through December 2011, with 65% of these cases being agricultural workers. One of the priorities for prevention identified by DOH is to improve communication between farms, and between sprayers and work crews on the same farm. The priorities also focus on tree fruit as the primary industry of concern, and identify the air blast sprayer method of application as being most commonly associated with drift cases in workers and other bystanders.

Content about preventing pesticide illness in schools, and Integrated Pest Management (IPM) approaches to managing pests was added to the DOH Healthy Schools Website.

<http://www.doh.wa.gov/CommunityandEnvironment/Schools/EnvironmentalHealth/Pesticides.aspx>

### **Intermediate Outcomes:**

Information obtained through DOH pesticide illness surveillance was provided to Washington State Division of Occupational Safety & Health (DOSH) and applied to their investigations of safety practices at more than 8 worksites. Examples are:

- A licensed pest control operator working for an irrigation district was exposed to acrolein when he checked the application equipment. He sustained severe injury and was hospitalized.
- Two farm workers developed severe symptoms after they were directed to enter cherry orchards 2 days after a Guthion application. Guthion is a restricted use pesticide and the re-entry interval after application is 15 days. DOSH cited employers for breaking re-entry rules and for not requiring respirators.
- Application of lambda-cyhalothrin, a synthetic pyrethroid, to an apple orchard drifted onto 9 workers. They were decontaminated by emergency response van and treated at a hospital.

Surveillance findings about the root-causes of pesticide-related illness in farm, forestry, and landscape occupations were incorporated into safe practices trainings conducted by Washington State Departments of Agriculture, Labor and Industries, and Natural Resources.

Pesticide-Illness surveillance data involving the control of bed bugs and hazards of “bug-bombs” is helping to promote Integrated Pest Management (IPM) approaches among managers, maintenance personnel, and residents of government-owned housing. DOH Pesticide Program staff met with King County government and public housing authorities to discuss pesticide-illnesses caused by misuse of pesticides in multi-unit dwellings in King County. With guidance and education materials from DOH Pesticide Program staff, King County Community Health Workers provided safe and effective pest control trainings at 7 locations in King County. These trainings were attended by multi-ethnic, multi-language, workers and residents of King County-owned housing. DOH staff introduced King County contacts to specialists in IPM techniques from Washington State University and are working together to plan a statewide “train-the-trainer” workshop on IPM approaches to pest management in multi-unit housing.

DOH Pesticide Program staff provided data and participated in work sessions of the Washington State House Committee on Labor and Workforce Development. Staff presented the causes of agricultural pesticide drift, provided case examples, and continues to work with partners to develop legislative and other strategies to prevent illness from pesticide drift.

Manufacturers of pesticidal strips that contain the chemical “dichlorvos” voluntarily agreed to product packaging and label changes, recommended by DOH after staff shared data about unintended human exposures and illness from the use of this product with the Washington State Department of Agriculture and the Environmental Protection Agency. Product packages will now be more clearly labeled to avoid use indoors (offices, kitchens, bedrooms, or elsewhere) where people may be present for extended periods of time.

### **End Outcomes:**

The extent to which surveillance activities have resulted in reduced pesticide-illness and improved safety at worksites is not known. One potential end-outcome is a reduction in illness cases involving early re-entry to fields where pesticides have been applied. DOH Pesticide Program staff is exploring whether a downward trend may follow improved and expanded education based on illness surveillance findings about the hazards of early re-entry. The impact of penalties for infractions is also being examined.

### **Publications and Presentations:**

Hudson NL, Kasner EJ, Beckman J, et al. “Characteristics and Magnitude of Acute Pesticide-Related Illnesses and Injuries Associated With Pyrethrin and Pyrethroid Exposures-11 States, 2000-2008.” American Journal of Industrial Medicine. May 2013.

Kasner EJ, Deralis JM, Mehler L, et al. “Gender Differences in Acute Pesticide-Related Illnesses and Injuries Among Farm workers in the United States, 1998-2007.” American Journal of Industrial Medicine. July 2012.

(Reported by) Rodriguez L, Prado J, Holland A, Beckman J, Calvert GM. “Notes from the Field: Acute Pesticide-Related Illness Resulting from Occupational Exposure to Acrolein-Washington and California, 1993-2009.” Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report. April 26, 2013.

Washington Department of Health, Pesticide Program. "Case Classification for Acute Pesticide-Related Illness or Injury." June 2013.

Pesticide Program staff presented case studies and discussed root-causes and prevention strategies with participants at 6 trainings required by Washington Department of Agriculture for pesticide applicator licensing.